DOE/EIA-0376(93)/S
Distribution Category UC-950

State Energy Price and Expenditure Report 1993 Supplement

May 1996

Energy Information Administration
Office of Energy Markets and End Use
U.S. Department of Energy
Washington, DC 20585

Supplement

Additional Measures of Energy Expenditures and Prices*

The *State Energy Price and Expenditure Report 1993 (SEPER),* published by the Energy Information Administration in December 1995, provides detailed estimates of energy prices and expenditures in nominal dollars. Energy expenditures are derived as the product of energy prices multiplied by energy consumption, with the latter adjusted to exclude energy used or lost by energy industries.

This supplement is an update and revision to the previous annual appendix to the *SEPER*. The previous appendix used price and expenditure data from the State Energy Price and Expenditure Data System (SEPEDS) to provide estimates of energy expenditures in constant dollars and fixed-weight energy prices, in both nominal and real terms. The appendix also included an analysis of the changes over time in energy expenditures and prices in relation to the measures of Gross Domestic Product, Gross Domestic Purchases, and Gross Domestic Purchase Prices published by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce.

In July 1995, the BEA published in the *Survey of Current Business* a "Preview of the Comprehensive Revision of the National Income and Product Accounts: BEA's New Featured Measures of Output and Prices." The comprehensive revision made major changes in the measures of real output and prices. The traditional measures of real output and prices were calculated by using the fixed-weight of a base year that was usually updated at the time of a comprehensive revision, about every 5 years. The new featured measures of output and prices are calculated by using the average weights of successive pairs of adjacent years. The new measures are called "chained" because the second year in each pair, with its weights, becomes the first year of the next pair. These annual chained averages form a time series that allows for the effects of changes in relative prices and changes in the composition of output over time.

The fixed-weighted measures previously used were calculated with a single set of weights over the entire time period. Use of fixed-weighted measures of real Gross Domestic Product (GDP) and prices for periods of other than those close to the base period resulted in a "substitution bias" that caused an overstatement of growth for periods after the base year and an understatement of growth for periods before the base year. The "substitution bias" reflects the fact that the commodities for which output grows rapidly tend to be those for which prices increase less than average or else decline. Thus, when the real GDP is recalculated by using the more recent price weights provided by chain-weighting, the commodities with strong output growth generally receive less weight, and growth in the aggregate measure is reduced.

In this supplement, the new methodology has been used to develop a set of chain-weighted estimates of energy expenditures and prices. These estimates, along with the new estimates by the BEA of chain-weighted measures of real output and prices, have been used to derive chain-weighted indices of energy expenditures divided by gross domestic product and energy expenditures divided by gross domestic purchases (Table 1) for the years 1970 through 1993 by using nominal and real prices and fixed-weight and chain-weight indices. Table 2 provides the real gross domestic product and real gross domestic purchases data used in developing the series shown in Table 1. Table 3 provides the estimates of nominal and real chain-weighted energy price indices for 1970 through 1993.

* The contribution made to this supplement by Jack Alterman, retired Assistant Commissioner for Economic Trends and Labor Conditions, Bureau of Labor Statistics, U.S. Department of Labor, is greatly appreciated. Questions regarding this supplement may be directed to Chuck Allen on 202-586-5828 or via internet at callen@eia.doe.gov.

Table 1. Chain-Weighted Real Energy Expenditures, Expenditures / Real Gross Domestic Product, and Real Energy Expenditures / Gross Domestic Purchases

Year	Energy Expenditures		Energy Expenditures / GDP Index (1992=100.0)	Energy Expenditures / Gross Domestic Purchases (1992=100.0)
	(Millions of Chained (1992) Dollars)	Index Based on Millions of Chained (1992) Dollars		
1970	348,931	73.8	136.0	133.5
1971	361,803	76.5	136.6	133.7
1972	384,831	81.4	137.8	134.6
1973	403,206	85.3	136.5	134.6
1974	393,262	83.2	133.6	133.0
1975	391,295	82.8	133.7	134.3
1976	413,244	87.4	133.8	133.0
1977	426,191	90.2	131.6	130.0
1978	438,079	92.7	128.8	127.4
1979	437,511	92.6	125.0	124.4
1980	418,947	88.6	120.0	121.4
1981	411,695	87.1	115.1	116.3
1982	397,179	84.0	113.5	114.0
1983	397,774	84.1	109.2	108.4
1984	417,287	88.3	107.3	105.0
1985	420,009	88.9	104.1	101.6
1986	425,123	89.9	102.3	99.6
1987	438,888	92.8	102.6	100.2
1988	458,495	97.0	103.3	101.7
1989	465,850	98.6	101.5	100.6
1990	464,808	98.3	100.0	99.5
1991	467,291	98.9	101.5	101.7
1992	472,699	100.0	100.0	100.0
1993	487,568	103.1	100.9	100.2

Sources: **Energy Expenditures—**State Energy Price and Expenditure Data System 1993.
Real Gross Product Index—Table 2.
Real Gross Domestic Purchases Index—Table 2.

Table 2. Real Gross Domestic Product and Real Gross Domestic Purchases Data, 1970-1993

Year	Real Gross Domestic Product		Real Gross Domestic Purchases	
	Billions of Chained (1992) Dollars	Index (1992=100.0)	Billions of Chained (1992) Dollars	Index (1992=100.0)
1970	3,388.2	54.3	3,469.1	55.3
1971	3,500.1	56.1	3,592.5	57.3
1972	3,690.3	59.1	3,794.0	60.5
1973	3,902.3	62.5	3,975.2	63.4
1974	3,888.2	62.3	3,925.7	62.6
1975	3,865.1	61.9	3,867.2	61.6
1976	4,081.1	65.4	4,122.9	65.7
1977	4,279.3	68.5	4,351.5	69.4
1978	4,493.7	72.0	4,565.7	72.8
1979	4,624.0	74.1	4,668.2	74.4
1980	4,611.9	73.9	4,578.6	73.0
1981	4,724.9	75.7	4,697.3	74.9
1982	4,623.6	74.0	4,622.7	73.7
1983	4,810.0	77.0	4,870.7	77.6
1984	5,138.2	82.3	5,274.4	84.1
1985	5,329.5	85.3	5,488.8	87.5
1986	5,489.9	87.9	5,666.1	90.3
1987	5,648.4	90.5	5,815.7	92.7
1988	5,862.9	93.9	5,983.9	95.4
1989	6,060.4	97.1	6,146.1	98.0
1990	6,138.7	98.3	6,202.1	98.9
1991	6,079.0	97.4	6,101.1	97.2
1992	6,244.4	100.0	6,274.0	100.0
1993	6,383.8	102.2	6,457.3	102.9

Sources: *Economic Report of the President,* February 1996, Appendix B Statistical Tables, Table B-2, pages 282 and 283. Original Source: Department of Commerce, Bureau of Economic Analysis.

Table 3. Nominal and Real Chain-Weighted Energy Price Indices, 1970-1993

Year	Nominal Energy Price Index (1992=100.0)	Gross Domestic Purchases Chained Price Index (1992=100.0)	Real Energy Price Index (1992=100.0)
1970	23.7	29.8	79.4
1971	24.8	31.4	79.0
1972	25.4	32.8	77.5
1973	27.7	34.8	79.6
1974	38.9	38.2	101.9
1975	43.9	41.8	105.0
1976	46.9	44.2	106.1
1977	51.7	47.2	109.6
1978	54.6	50.7	107.6
1979	67.9	55.3	122.8
1980	89.2	61.1	146.1
1981	103.6	66.8	155.1
1982	107.0	70.7	151.3
1983	104.5	73.2	142.8
1984	103.9	75.9	136.9
1985	103.7	78.4	132.2
1986	89.7	80.4	111.5
1987	89.7	83.1	107.9
1988	88.9	86.1	103.3
1989	93.3	89.8	103.9
1990	101.1	93.8	107.8
1991	100.0	97.3	102.8
1992	100.0	100.0	100.0
1993	101.2	102.5	98.7

Sources: **Nominal Energy Price Index—**State Energy Price and Expenditure Data System 1993.
Gross Domestic Purchases Price Index—*Economic Report of the President,* February 1996, Appendix B Statistical Tables, Table B-3, page 285. Original Source: Department of Commerce, Bureau of Economic Analysis.
Real Energy Price Index—Column 1 divided by Column 2.